

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application

Listing of Claims:

1. (Currently Amended) An image recognizing method comprising the steps of:
 - (a) dividing an input image into a plurality of local-segments;
 - (b) registering a learning image into a learning image database;
 - (c) selecting a local-segment from the plurality of local-segments;
 - (d) extracting a learning-local-segment from the learning image database which is similar to the selected local-segment;
 - (e) relating the extracted learning-local segment to the selected local-segment;
 - (f) estimating a position of an object to be identified in the input image from coordinates of the selected local-segment and coordinates of the related learning-local-segment;
 - (g) updating a score of the estimated position in the input image:
 - ~~(g)~~(h) repeating steps (c), (d), (e), ~~and~~ (f) and (g) for each local-segment of the plurality of local-segments; and
 - ~~(h) — counting pairs formed of one of the local segments and the related learning local segment having an estimated position for the object substantially equal to a first position to determine a score for the first position~~ to provide a score which indicates whether the object to be identified is present at a first position; and
 - (i) judging that the object to be identified is present at the ~~first~~ estimated position when the ~~determined~~ updated score is greater than a predetermined number.
2. (Currently Amended) An image recognizing method comprising the steps of:
 - (a) dividing an input image into a plurality of local-segments;

(b) dividing a learning image into a set of learning-local-segments having a same size as the local-segments and making subsets, each ~~subset~~ formed of ~~learning-local-segments~~, ~~from the set of learning-local-segments~~, which are similar to each other;

(c) for each of the subsets of learning-local-segments, registering image data of a representative learning-local-segment and coordinates of all of the learning-local-segments of the corresponding subset into a same-type window database;

(d) selecting a local-segment from the plurality of local-segments;

(e) extracting a representative learning-local-segment from the same-type window database which is similar to the selected local-segment;

(f) relating the selected local-segment to ~~one a~~ subset of the subsets ~~of learning-local-segments~~ which includes the ~~extracted~~ representative learning-local-segment;

(g) estimating a position of an object to be identified in the input image from coordinates of the selected local-segment and coordinates of the related representative learning-local-segment;

(h) updating a score of the estimated position in the input image;

~~(h)~~(i) repeating steps (d), (e), (f), ~~and (g)~~ and (h) for each local-segment of the plurality of local-segments; and

~~(i) counting pairs formed of one of the local-segments and the related representative learning-local-segment having an estimated position for the object substantially equal to a first position to determine a score for the first position; and~~

(j) judging that the object to be identified is present at the first-estimated position when the ~~determined~~ updated score is greater than a predetermined number.

3. (Currently Amended) The image recognizing method according to claim 1, wherein:

said step (b) comprises the step of registering the learning image into the learning image database by a characteristic of the object to be identified;

said step (d) comprises the step of extracting the learning-local-segment which is similar to the selected local-segment from the learning image database by the characteristic; and

said step ~~(h)~~(g) comprises the step of ~~counting pairs formed of one of the local segments and the related learning local segment~~updating the score of the estimated position by the characteristic.

4. (Previously Presented) The image recognizing method according to claim 2, wherein said step (c) comprises the step of, for each subset of learning-local-segments, registering image data of the representative learning-local-segment and coordinates of all of the learning-local-segments of the corresponding subset and a characteristic of the object to be identified into the same-type window database.

5. (Previously Presented) The image recognizing method according to claim 1, wherein:

step (d) includes the steps of;

(d-1) calculating a sum of one of (i) each square of a difference between a pixel value of the selected local-segment and a pixel value of one of the learning-local-segments and (ii) each absolute value of the difference between the pixel value of the selected local-segment and the pixel value of the one of the learning-local-segments for each learning-local-segment; and

(d-2) extracting a pair formed of the selected local-segment and a learning-local-segment for which the sum is minimized; and

step (e) includes the step of relating the selected local-segment to the learning-local-segment in the pair extracted in said step (d-2).

6. (Previously Presented) The image recognizing method according to claim 2, wherein:

step (e) includes the steps of;

(e-1) calculating a sum of one of (i) each square of a difference between a pixel value of the selected local-segment and a pixel value of one of the representative

learning-local-segments and (ii) each absolute value of the difference between the pixel value of the selected local-segment and the pixel value of the one of the representative learning-local-segments for each learning-local-segment; and

(e-2) extracting a pair formed of the selected local-segment and a representative learning-local-segment for which the sum is minimized; and

step (f) includes the step of relating the selected local-segment to the representative learning-local-segment in the pair extracted in said step (e-2).

7. (Currently Amended) An image recognizing apparatus comprising:

image dividing means for dividing an input image into a plurality of local-segments;

learning means for registering a learning image into a learning image database;

similar window extracting means for selecting a local-segment from the plurality of local-segments, for extracting a learning-local-segment from the learning image database which is similar to the selected local-segment, and for relating the extracted learning-local-segment to the selected the local-segment;

object position estimating means for estimating a position of an object to be identified in the input image from coordinates of the selected local-segment and coordinates of the related learning-local-segment;

counting means for counting ~~pairs formed of one of the local-segments and the related learning-local-segment having an estimated position for the object substantially equal to a first position to determine a score for the first position~~ a score of the estimated position in the input image; and

object determining means for judging that the object to be identified is present at the ~~first-estimated~~ position when the ~~determined-counted~~ score is greater than a predetermined number.

8. (Currently Amended) An image recognizing apparatus comprising:

image dividing means for dividing an input image into a plurality of local-segments;

learning means for dividing a learning image into a set of learning-local-segments having a same size as the local-segments and for making subsets, each subset formed of learning-local-segments, from the set of learning-local-segments, which are similar to each other and for each subset of learning-local-segments, registering a representative learning-local-segment and coordinates of all of the learning-local segments of the corresponding subset into a same-type window database;

similar window extracting means for selecting a local-segment from the plurality of local-segments, for extracting from the same-type window database a representative learning-local-segment of one subset of the subsets which is similar to the selected local-segment of the input image, and for relating the extracted representative learning-local-segment to the selected local-segment;

object position estimating means for estimating a position of an object to be identified in the input image from coordinates of the selected local-segment and coordinates of the related representative learning-local-segment;

counting means for counting ~~pairs formed of one of the local segments and the related representative learning local segment having an estimated position for the object substantially equal to a first position to determine a score for the first position~~ a score of the estimated position in the input image; and

object determining means for judging that the object to be identified is present at the first-estimated position when the ~~determined-counted~~ score is greater than a predetermined number.

9. (Currently Amended) An image recognizing apparatus comprising:

image dividing means for dividing an input image into a plurality of local-segments;

learning means for registering learning images by a characteristic of an object to be identified into a learning image database;

similar window extracting means for selecting a local-segment from the plurality of local-segments, for extracting a learning-local-segment from the learning image database by the

characteristic which is similar to the selected local-segment, and for relating the extracted learning-local-segment to the selected local-segment by the characteristic;

object position estimating means for estimating a position of an object to be identified in the input image from coordinates of the selected local-segment and coordinates of the related learning-local-segment by the characteristic;

counting means for counting ~~pairs formed of one of the local-segments and the related learning-local-segment having an estimated position for the object substantially equal to a first position to determine a score for the first position~~ a score of the estimated position in the input image by the characteristic; and

object determining means for judging that the object to be identified is present at the first-estimated position when the ~~determined-counted~~ score is greater than a predetermined number.

10. (Previously Presented) The image recognizing apparatus according to claim 8, wherein said learning means includes:

similar window integrating means for making the subsets of learning-local-segments which are similar to each other and for releasing image data of the representative learning-local-segment of each subset and the coordinates of all of the learning-local-segments in each subset; and

a same-type window database for storing the image data of the representative learning-local-segment of each subset and the coordinates of all of the learning-local-segments in each subset.

11. (Currently Amended) A computer-readable storage medium holding a program for making a computer carry out an image recognizing method, said image recognizing method comprising the steps of:

- (a) dividing an input image into a plurality of local-segments;
- (b) registering a learning image into a learning image database;
- (c) selecting a local-segment from the plurality of local-segments;

(d) extracting a learning-local-segment from the learning image database which is similar to the selected local-segment of the input image;

(e) relating the extracted learning-local-segment to the selected local-segment;

(f) estimating a position of an object to be identified in the input image from coordinates of the selected local-segment and coordinates of the related learning-local-segment;

(g) updating a score of the estimated position in the input image;

~~(g)~~(h) repeating steps (c), (d), (e), ~~and (f)~~ and (g) for each local-segment of the plurality of local-segments; and

~~(h) counting pairs formed of one of the local segments and the related learning local segment having an estimated position for the object substantially equal to a first position to determine a score for the first position; and~~

(i) judging that the object to be identified is present at the ~~first~~ estimated position when the ~~determined~~ updated score is greater than a predetermined number.

12. - 19. (Canceled)